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INFLUENCE OF A CITY ON FARMING.

[A study of types of farms and their organization in Jefferson County, Ky.]

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CONTENTS.

OBJECT AND RESULTS.

This bulletin gives the results of a study of the agriculture of Jefferson County, Ky., a locality which is influenced greatly by a moderately large and growing city (Louisville). In response to a favorable and increasing market for vegetables, an increasing area of land is being utilized for trucking. The raising of such crops as potatoes and onions has been profitable, principally on account of exceptional marketing facilities. The raising of cereals, while still important, has declined. The city offers an expanding market for dairy products, but by means of railways and trolleys the city is quickly and cheaply reached by dairy farms located a long distance out, where cheaper land and other favorable conditions enable the farmer to compete successfully in the dairy market. With the growth of the city, the extension of trolley lines, and the improvement of highways, an increasing number of people occupied in the city are living in suburban towns and in the near-by country. All these factors combined create a set of conditions which bring about rapid changes in agricultural practice. Old types of farms once dominant are disappearing and new types are organized to profit by the opportunities offered. Farms that were once profitable as large units, under an extensive system of agriculture, come to be

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relatively unprofitable under new conditions creating higher values for real estate.

It is the purpose of this study to analyze these conditions in order to arrive at an understanding of the underlying principles of farm organization and practice here, to point out the more profitable types of farming, and to show how some of the more successful farms are organized.

The important conclusions drawn from this study are: (1) For the area surveyed the small farm intensively cultivated is the most efficient and profitable. (2) The most profitable types found are those specializing in potatoes and truck. (3) Dairying combined with truck farming is profitable here, but as a type it is gradually being pushed farther away from the city to cheaper land. (4) The general mixed type of farm, representing the extensive system and a high degree of diversity, is the least profitable in this area.

SOURCES OF INFORMATION AND BASIS OF STUDY.

In the fall of 1913 about 50 farms were visited in representative sections of Jefferson County. In this survey a detailed study was made of the leading crop enterprises, such as Irish potatoes, sweet potatoes, onions, a few other important truck crops, wheat, corn, orchard grass, timothy, and clover. Two produce exchanges were found successfully working in the county. A careful study was made of these. The city market was also made an object of study, as well as the wagon roads and trolley lines radiating from it into the farming community. In 1915 another farm-management survey was made of 100 farms in this area representing various types. These farms were located as shown by the dots in figure 1. In this survey a careful study was made of the organization and the business success of each farm.

Information relative to changes which have occurred in types of farming was obtained from the United States census statistics; Bureau of Crop Estimates, United States Department of Agriculture; and from direct observation and consultation with farmers in the region.

GENERAL CONDITIONS.

THE CITY AND THE COUNTY.

Jefferson County lies along the Ohio River where that stream has worn its channel through a low rim of mountains which form the western boundary of the Bluegrass Region. Thus it is a natural gateway for travel and transportation between much of eastern and central Kentucky and the western part of the State.

In the bend of the river below the Falls of the Ohio is the city of Louisville, occupying an area of about 28 square miles, with a population in 1916 of 267,342. Good macadam roads radiate from the

city to various parts of the county. Along several of these highways trolley lines have been built, connecting small towns and suburban homes with the city. These, with several steam lines running out from the city, give the locality an excellent system of transportation. (See map, fig. 1.) Louisville is a large distributing center, with important machine factories and distilling and brewing establishments. There are minor establishments for canning vegetables and making pickles, sauerkraut, catsup, etc. These are important agriculturally, in that they give market gardeners a market for various surplus vegetables.

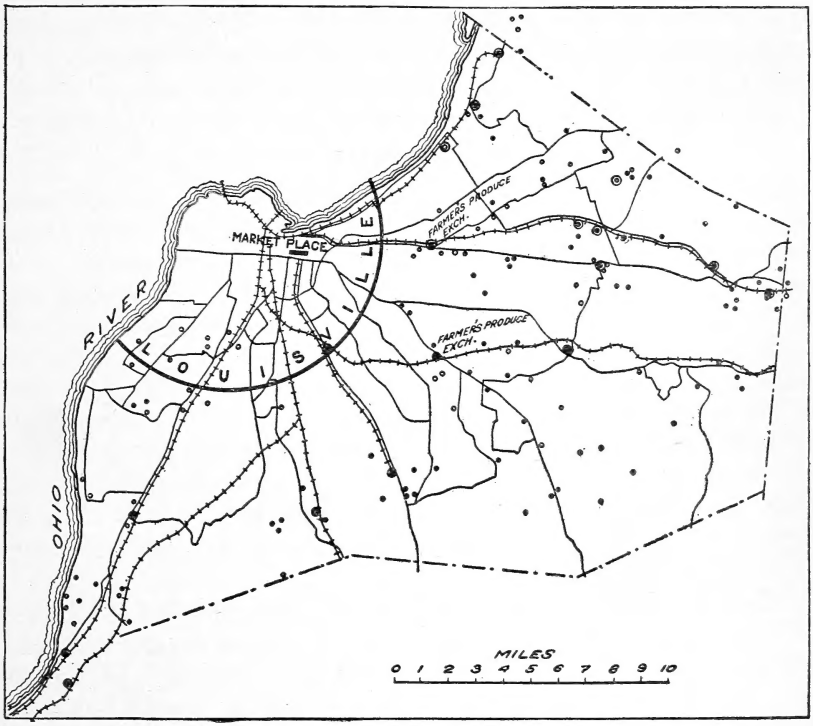

FIG. 1.—Map of area studied. Dots indicate farms visited.

The city market place is operated by an association of farmers and business men. The distance from Louisville to the farms included in this study is considered to be the distance from the market place to these farms. During the season of fresh vegetables and fruits this market place from early morning until noon each day is filled with vehicles of the truckers from the country. Here dealers and individual consumers come to buy the farmers' produce.

There are two important farmers' marketing and shipping establishments outside the city limits, one at St. Matthews and one at Buechel, both in localities where the Irish potato is the dominant enterprise.

POPULATION.

In 1910 the rural population of Jefferson County, including unincorporated towns, was 38,992, showing an increase of 42.4 per cent during the preceding ten years. During the same period the city population had increased 9.1 per cent. These figures indicate a rapid growth of suburban population. Outside of unincorporated towns, the increase was over 30 per cent. The increase in actual farm population was comparatively small, however—probably not over 10 per cent, since an increasing number of people who have occupations in the city are living in homes in the country. Seven per cent of the population in 1909 was foreign born and 32 per cent of mixed parentage. Much the larger part of the foreign population is German.

FACTS ABOUT FARMING SHOWN BY THE CENSUS OF 1900 AND OF 1910.

In 1909, according to the census figures, there were 3,093 farms in the county, an increase in ten years of about 9 per cent. During the previous decade the number of farms under 100 acres in size had increased 17 per cent, while farms over 100 acres in size had decreased about 14 per cent. During the same period the area devoted to the raising of vegetables had increased about 29 per cent, and the area devoted to cereals decreased about 22 per cent (see Table I).

TABLE I.—*Changes in crop production during the decade 1899–1909.*

Crop	1900 acreage.	1910 acreage.
Small fruits:		
Strawberries	818	443
Other berries	1,137	631
Total	1,955	1,074
Vegetables:		
Potatoes	6,525	9,255
Sweet potatoes	1,093	1,107
Other vegetables	5,787	6,920
Total	13,405	17,282
Cereals:		
Corn	33,316	31,200
Wheat	18,136	9,493
All cereals	55,672	43,280

Within the county, during the decade 1899 to 1909, there was a marked decrease in the production of market milk, while three adjoining counties farther out, with railway communications, had a marked increase in milk sold (see Table II). The decrease in Jefferson County was 43 per cent, while the increase in three outside counties was about 232 per cent. Jefferson county had a large increase in the amount of butter and cream sold, which to some extent made up for the loss in market-milk production. Butter, however, is made in small quantities as a by-product on nearly all types of farms, so that the increase in this product can not be said to make up the loss

in market-milk production. The census figures further show a decrease in the number of dairy cows in Jefferson County and an increase in the three outside counties during the same period.

TABLE II.—*Changes in the dairy business during the decade 1899–1909.*

Area.	Milk sold.		Cream sold.		Butter sold.	
	1900	1910	1900	1910	1900	1910
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Pounds.*	*Pounds.*
Jefferson County	2,695,233	1,542,455	5,757	24,342	239,926	528,915
Three counties outside of Jefferson in vicinity of Louisville	566,121	1,879,136	58,830	74,785	209,906	230,244

HISTORY OF IMPORTANT CROP AND STOCK ENTERPRISES SINCE 1840.

The figures of the United States Census Bureau relative to crops and live stock give a fairly good history of these enterprises since 1840. The high point of cereal production, characteristic of general mixed farming, was reached in 1870. Since then these crops have had a marked decline, while Irish potatoes, sweet potatoes, and other vegetables, characteristic of potato-truck and strictly truck farming, have had a corresponding increase (see Table III).

TABLE III.—*Statistics of crop production, 1840 to 1910.*

Year.	Corn.	Wheat.	Rye.	Barley.	Oats.	Hay.	Hemp.	Tobacco.	Irish potatoes.	Sweet potatoes.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Tons.*	*Tons.*	*Pounds.*	*Bushels.*	*Bushels.*
1840	665,899	115,175	16,969	1,750	156,092	5,470	[a] 312½	75,360	[b] 60,604	.....
1850	983,429	92,809	2,300	6,110	128,522	4,944	120	9,500	106,657	8,204
1860	974,110	155,785	12,352	45,305	134,029	9,543	204	13,560	177,963	31,854
1870	1,059,729	102,820	12,454	49,975	368,328	11,228	38	9,574	377,382	104,862
1880	1,056,209	186,212	10,413	21,643	114,793	11,186	.....	11,632	269,066	99,307
1890	712,674	217,831	7,624	3,669	148,350	27,761	.....	5,910	737,533	117,817
1900	1,003,130	239,880	3,030	.....	91,570	[c] 27,589	.....	132,840	887,640	150,832
1910	947,024	147,835	3,708	.....	45,932	.....	.....	263,200	1,195,631	174,721

[a] Tons of hemp and flax. [b] Hay and forage. [c] Potatoes.

There have not been any significant changes in the total amount of live stock kept on the farm. Swine production fell off to a marked extent with the falling off of corn production. Dairy cattle reached their high mark in 1890 and 1900. Since then there has been a falling off in dairy production. (See Table IV.)

TABLE IV.—*Statistics of live stock, 1840 to 1910.*

Year.	Horses.	Sheep.	Swine.	Total cattle.	Milch cows.	Other cattle.	Working oxen.
1840	[a] 6,886	14,971	42,266	[b] 12,716	.....	.....	.....
1850	4,893	10,798	39,573	7,987	4,338	3,220	429
1860	5,915	7,911	35,921	10,087	5,492	4,230	365
1870	6,360	7,089	34,575	9,334	6,263	2,957	114
1880	6,278	[c] 12,335	25,976	11,347	6,553	4,740	54
1890	7,820	7,463	16,932	13,250	8,565	4,664	21
1900	7,792	8,622	18,481	13,876	8,750	5,126	.....
1910	7,062	7,411	13,700	11,129	7,594	3,535	.....

[a] Includes mules. [b] Neat cattle. [c] Exclusive of spring lambs.

The history of crop yields since 1880 (see Table V) shows that for cereals the yield has been about stationary, while for intensive crops such as tobacco and potatoes the tendency seems to be toward an increased yield. Figures for determining the yields of the many different vegetables are not available. There is a tendency toward the increased use of commercial fertilizer, which is undoubtedly a factor in the increased yield of potatoes especially, and no doubt the yield of other vegetable crops has been increased thereby. The 1900 census gives the value of fertilizers used as $90,300, while that of 1910 gives $148,582. Besides commercial fertilizer, a large amount of stable manure is bought in Louisville and hauled to the truck farms.

TABLE V.—*Comparison of crop yields in Jefferson County, Ky., during 4 census years.*

Crop.	Yield per acre.			
	1880	1890	1900	1910
Corn.....bushels..	27.3	31.2	30.1	30.4
Wheat.....do....	12.9	16.8	13.2	15.6
Rye.....do....	9.5	10.1	15.2	12.0
Barley.....do....	23.7	18.5	.....	.....
Oats.....do....	14.3	12.0	22.9	20.2
Hay.....tons..	.7	1.0	1.2	1.1
Tobacco.....pounds..	447.4	738.7	790.7	978.4
Irish potatoes.....bushels..	(a)	157.2	136.0	238.3
Sweet potatoes.....do....	118.7	143.3	138.0	157.8

a No data available.

SOIL AND CLIMATE.

No soil survey has been made of Jefferson county. The soil in the northeastern part of the county is a clay loam similar in character to the bluegrass soils farther east. While much of the soil in this portion of the county is fundamentally of limestone origin, there is a large mixture of river deposit, especially where the land is level. This deposit from the ancient overflow of the river has given the soil a dark color and a different texture from that of purely limestone origin.

Along the river south of Louisville there is a strip of land 15 to 20 miles in length and 1 to 7 miles in width which has more of the character of a sandy loam. This section is lower in elevation than the section east of the city and in some places is swampy. While it is productive and capable of maturing vegetables earlier than the heavy soils east, it has not been in as much demand for residence property. Thus the market value of land along the river and south of the city is lower in price than land of equivalent agricultural value toward the eastern portion of the county.

The southeastern part of the county has relatively the poorest quality of soil, besides a portion of it being hilly or mountainous.

Except where the low rim of mountains above mentioned enters the county, the topography is generally level. Much of the region might be termed river-bottom land.

The climate is typical of that found in the lower elevations of the south-central States (see figures 2 and 3). The winters are comparatively wet, the highest average rainfall coming in March. The

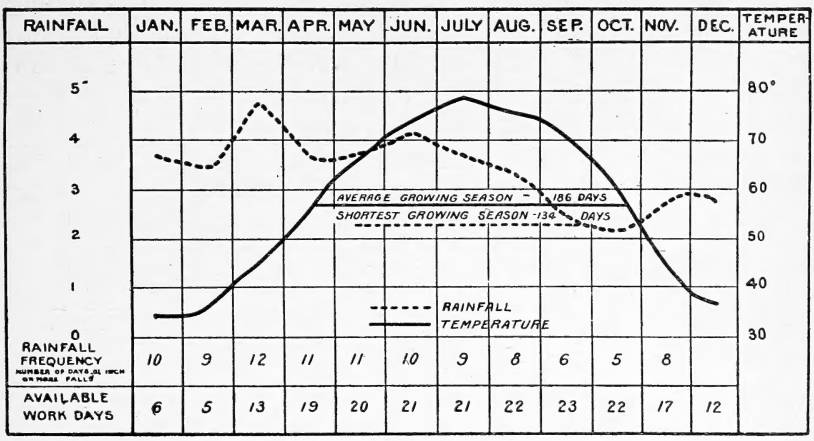

FIG. 2.—Diagram showing average climatic conditions.

dry season begins in July and ends in November. The average growing season extends from about the middle of April to a little past the middle of October, a period of about 186 days. During the year about 200 days are available for field work.

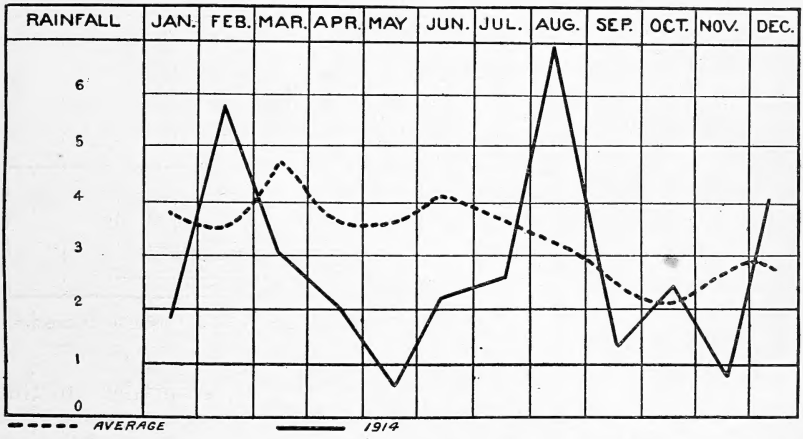

FIG. 3.—Diagram showing actual rainfall in 1914, with normal.

SEASONAL DISTRIBUTION OF LABOR REQUIRED BY CROPS.

The seasonal limits within which a crop is raised and marketed are determined largely by the climate. Long agricultural experience in a locality will result in the selection of such crops as are adapted to the natural and economic environment, and will establish a common practice in cultivating and harvesting them. Thus is devel-

oped a cropping system which is characteristic of the community. Figures 4 and 5 show the seasonal distribution of labor on the principal crops in this locality. Truck crops, of course, have an important relation to the cropping system here, but they are so numerous and the practice related to them so complicated that it was thought best not to give in this bulletin the seasonal distribution of labor on any of them except Irish potatoes, sweet potatoes, and

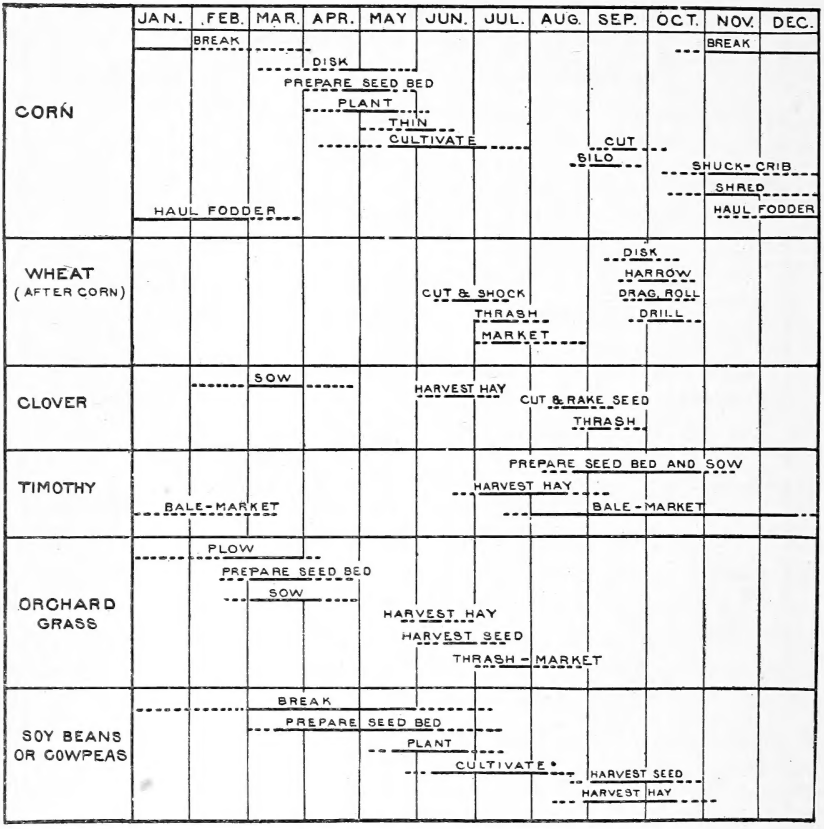

FIG. 4.—Diagram showing the seasonal work on general field crops. (Solid lines indicate average season; dotted lines extreme range.

onions, which have on farms a place more nearly equivalent to that of general field crops.

The heavy lines show the limits of the average season for the operations required. The dotted lines show the variation in the practice of different farms or the variations on the same farm from year to year due to weather conditions. Charts of this kind have been used by individual farmers and found to be of considerable practical value, in that they help to form a mental picture of the seasonal labor requirement for the year.

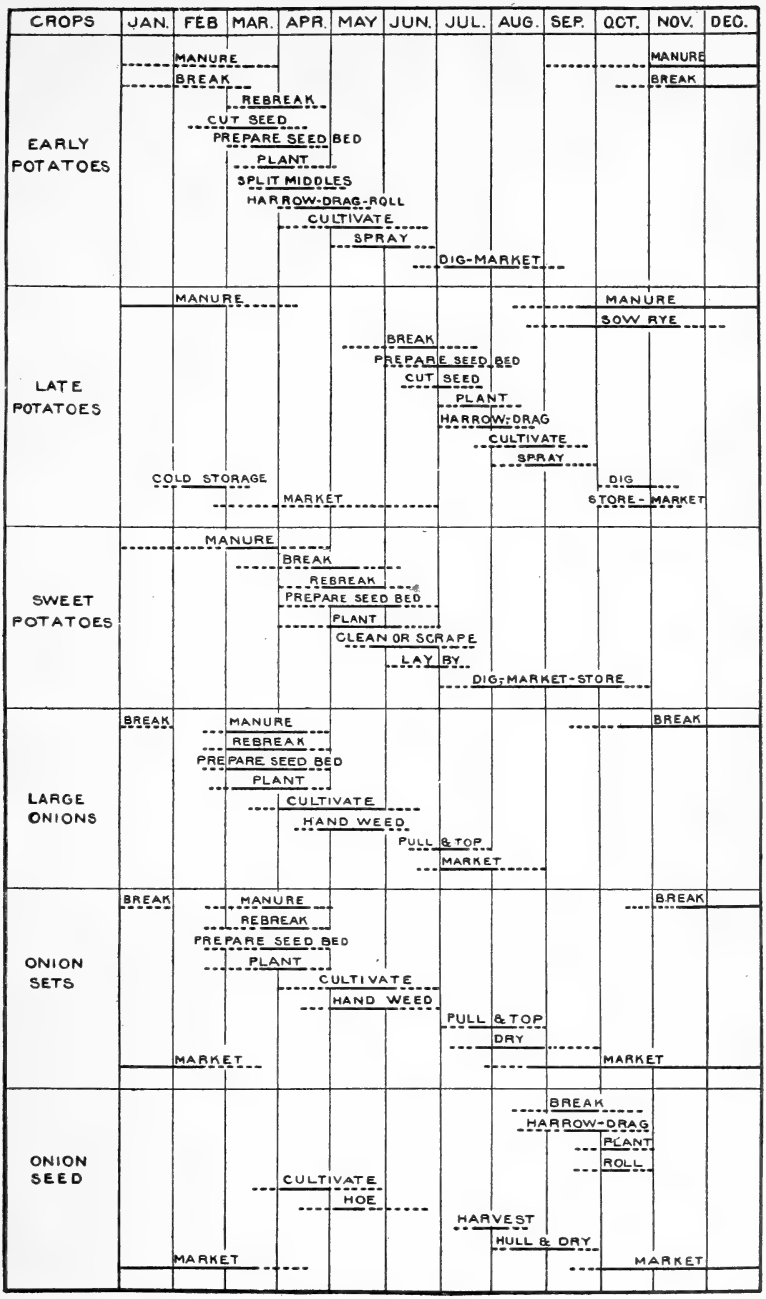

FIG. 5.—Diagram showing the seasonal work on potatoes and onions. (Solid lines indicate average season; dotted lines extreme range.)

DESCRIPTION OF FARM PRACTICE.

As will be shown in the following pages, several types of farming are found here, representing two general systems of farm practice, the extensive and the intensive. The farms practicing the extensive system are found toward the eastern part of the county and become more nearly typical as the bluegrass region is approached. These farms usually are large or medium-sized. The rougher and stony parts are kept in permanent bluegrass pasture. Orchard grass and clover are grown in rotation with grain and potatoes. Live-stock enterprises, dealing chiefly with beef cattle, dairy cows, sheep, swine, and horses, are important. Irish potatoes, which often take the place of corn as an intertilled crop on these general farms, commonly occupy 25 to 50 acres.

TABLE VI.—*Relative distance from market and size of farm to diversity and intensity of cultivation, illustrated by 17 farms.*

Farm No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Distance to Louisville (miles)	20	20	20	14	12	10	10	9	8	8	8	5	5	5	5	4	4
Size of farm (acres)	350	340	300	60	60	65	297	247	137	324	80	70	100	53	12½	130	35
Value of land per acre	$100	$100	$200	$100	$100	$100	$75	$100	$100	$200	$600	$300	$600	$700	$700	$500	$650
	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac
Potatoes, first	25	....	45	5	4	1½	18	15	10	32	30	35	11	20	4	40	25
Potatoes, second	8	50	5	10½	5	9	28	20	15	14	....	10	50	a 21	....	....	a 25
Sweet potatoes	....	....	....	....	....	....	....	....	....	....	9	....	13	10	2	12	....
Cabbage	....	....	....	....	....	....	....	....	....	....	7	a 2	a 6	4	1½	a 10	4
Field onions	....	....	....	....	....	....	....	....	4	....	5	....	a 4	4	1	a 4	1½
Onion sets	....	4	....	....	....	....	....	....	....	....	....	a 1	....	....	1	a 8	3
Onion seed	....	23	....	....	1½	....	....	....	....	....	....	....	a 15	....	....	....	....
Tomatoes	....	....	....	1½	....	....	....	....	....	....	....	a ½	4	....	1	3	....
Roasting ears	....	....	....	....	....	....	....	....	....	....	....	....	a 10	....	....	10	....
Lettuce	....	....	....	....	....	....	....	....	....	....	....	....	3	½	....	a 2	....
Beets	....	....	....	....	....	....	....	....	....	....	....	a ¼	....	....	¾	3	....
Asparagus	....	....	....	....	....	....	....	....	....	....	2	....	4	....	....	4	....
Carrots	....	....	....	....	....	....	....	....	....	....	....	....	1	¼	....	....	....
Rhubarb	....	....	....	....	....	....	....	....	....	....	....	....	1½	....	½	3	....
Cauliflower	....	....	....	....	....	....	....	....	....	....	2	1	....	....	....	2	....
Beans	....	....	....	....	....	....	....	....	....	....	....	a ¼	a 6	....	....	....	....
Cucumbers	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....
Horse radish	....	....	....	....	....	....	....	....	....	....	1	....	2	....	½	4	....
Parsnips	....	....	....	....	....	....	....	....	....	....	1	5	4	....	....	....	....
Peppers	....	....	....	¼	....	....	....	....	....	....	....	....	....	....	....	....	....
Spinach	....	....	....	....	....	....	....	....	....	....	....	a 6	a 2	....	....	1	....
Melons	....	....	....	....	1	1	....	....	....	....	....	....	1½	....	....	....	....
Cantaloupes	....	....	....	....	1½	....	....	....	....	....	....	....	....	....	....	5	....
Strawberries	....	4	....	....	2	1	....	....	....	....	....	....	....	....	....	....	....
Blackberries	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cherries	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Grapes	....	4½	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Apples	....	6	....	....	....	7	....	....	....	....	....	5	....	....	....	5	....
Pears	....	....	....	....	....	5	....	....	....	....	....	....	....	....	....	....	....
Corn	50	22	27	....	11	20	50	45	20	19	....	12	....	....	....	12	....
Wheat	100	....	80	....	....	....	100	52	50	120	....	....	....	....	....	....	....
Oats	35	....	20	5	3	5	....	....	....	12	....	4	....	....	....	....	....
Rye	a 30	....	....	a 20	....	a 10	a 20	a 20	....	a 15	a 5	a 15	a 13	....	....	10	....
Clover	40	35	60	15	....	....	....	....	....	30	....	....	....	....	....	....	....
Timothy	....	....	4	3	10	....	25	30	10	26	10	15	8	....	....	....	....
Orchard grass	40	....	....	....	5	....	....	....	....	10	....	....	....	....	....	....	....
Cowpeas	5	20	4	11	....	....	....	....	8	a 10	....	....	....	....	....	....	....
Alfalfa	....	10	....	....	....	....	....	....	....	....	5	....	4	....	....	6	....
Millet	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....
Soy beans	15	....	35	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cane	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
Crab grass	....	....	....	....	....	....	....	....	a 30	a 10	....	....	....	....	....	....	....

a Double cropped.

On the smaller farms nearer the city the farm practice is entirely different. About all the tillable area of these farms is planted in field or truck crops, a very small percentage being left for pasture. Much of the land is double-cropped. These farms near the city are smaller in size than those 10 to 20 miles out. The size of the business conducted on many of them is large, however, owing to more intensive cultivation. These farms show greater diversity than the big farms, and the crops require much more labor and fertilizer per acre. These factors are well illustrated in Table VI.

The truck gardeners generally keep something growing on the land all the year. Kale and spinach are favorite winter crops. Some of the crop may be marketed in the late fall and early spring, and the remainder is turned under. Rye is commonly sown to be turned under for a late crop of potatoes.

RELATION OF DISTANCE FROM CITY TO TYPE OF FARMING.

The farm records taken were distributed as evenly as possible over the county and no thought was given to the selection of any particular type of farm. For this reason the farms at different distances from the city will represent fairly well average conditions. Mention should be made, however, of one factor which interferes to some extent with a study of farms grouped according to distance from the city. As previously stated, a strip of land extending 20 or more miles south along the Ohio River is almost wholly utilized for trucking, so that for this area the factor of soil has a predominating influence. Table VII would indicate, nevertheless, that distance from the city has an important influence on the type of farming. Truck crops (except as influenced by the factor just mentioned) and potatoes are dominant enterprises near the city. Receipts from such field crops as corn, wheat, hay, hogs, and stock cattle are grouped in the table under the head "Receipts, per cent, from other sources." These enterprises are characteristic of general mixed farming, and become more important as the distance from the city increases. Dairying also becomes more important as distance from the city increases.

TABLE VII.—*Relation of distance from city to type of farm.*

Distance from Louisville.	Number of records.	Size of farm.	Rent of land per acre.	Receipts, per cent.		
				From truck and potatoes.	From dairy.	From other sources.
8 miles or less	25	102	$11.85	68	10	22
9 to 11 miles	18	221	5.59	35	12	53
12 to 14 miles	24	256	5.37	34	20	46
15 miles and over	33	257	4.66	20	27	53
All farms	100	211	6.80	38	18	44

These facts relative to the type of farming have an important relation to the value of land and the size of farm, as is indicated also in this table. Farms increase in size and the rent per acre decreases as the distance from the city increases.

The lesson to be learned from these facts is that close proximity to a large growing city tends to make it more profitable to grow truck crops which can be marketed fresh to the consumers in the city than the staple crops characteristic of general farming and supplying a wide market. The nearer a location is to the city the more valuable the land becomes, because it is demanded for dwelling, factory, and transportation sites, etc., in competition with agriculture. On high-priced land none but intensive agriculture will pay. Because land is more valuable near the city, and since a large farm business may be conducted on a small piece of land, the farms tend to be smaller near the city.

Frequently a farmer owning a comparatively large tract of land, 300 to 400 acres, finds the city growing towards him, increasing year by year the value of his land. With this increase in value of land goes an increase in costs of production. Unless the farmer changes his type of farming to meet these conditions his business can not be made to yield interest on the increased capitalized value and a profit in addition. Under such conditions the farmer usually sells all or a part of his land to be divided into smaller tracts, either for dwelling and industrial sites or for smaller farms operated more intensively.

THE SMALL, INTENSIVE FARMS NEAR THE CITY ARE THE MOST PROFITABLE.

With intensive farming and higher production per acre the farmer is enabled to carry on a good-sized business on a small-sized farm. In fact, in this study no relation appeared between the size of the farm and the size of the business conducted. The capital invested in the average large farm did not differ materially from that invested in the small intensive farm. (See Table VIII.)

TABLE VIII.—*Relation of size of farm to operating expenses per acre and to land earnings per acre.*

Size of farm.	Number of farms.	Distance to Louisville.	Average area of improved land.	Operating expense per acre.	Gross receipts per acre.	Land earnings per acre.[a]	Labor income.	Profit on investment.
		Miles.	*Acres.*					*Per cent.*
Less than 80 [b]	21	9	44	$73	$96	$23	$1,000	7
80 to 159	25	12	121	36	45	9	800	5.6
160 to 299	33	13	212	15	20	5	100	4
300 and over	21	16	420	14	18	4	140	4
All farms	100		199	32	42	10		

[a] Land earnings per acre as here used is what is left after paying all operating expenses, which include all current expenses, 6 per cent interest on working capital, and the farmer's estimate of the value of his labor and services as manager, amounting for the average farm to about $600. Land earnings would be then approximately what the landlord might expect as rent.

[b] Improved land.

According to Table VIII the average farmer with less than 80 acres spends $73 per acre in operating expenses and gets $96 per acre in gross receipts, thus making each acre earn, net, $23. On the other hand, the average of 21 farms over 300 acres in size expends in operating expenses $14 per acre and gets $18 per acre gross receipts, making each acre earn but $4. Among the farms represented in the table, the small, intensive farm is the more profitable, both from the standpoint of wages for the operator and from the standpoint of invested capital.

The average of 21 farms less than 80 acres in size gives the operator a labor income of $1,000 and 7 per cent on capital invested, while the average of 21 farms over 300 acres in size gives the operator a labor income of only $140 and 4 per cent on capital. The main reason for low profits on the larger as compared with smaller farms is that many of the larger farms are not doing intensive enough agriculture to meet the new conditions brought about by a large and growing city.

DISTANCE FROM THE CITY A FACTOR IN THE VALUE OF LAND.

As has been pointed out, the building of good roads, the extension of trolley lines, and the nearness of the city have made much of the land in this section desirable for other than agricultural use. Such conditions will naturally make the average market value of land higher than it should be for agricultural use alone. As would be naturally expected, the market value of land will tend to increase as the distance from the city becomes less. This is indicated in Table IX. Other conditions, such as soil and topography, however, may counteract the influence of the city.

TABLE IX.—*Influence of the nearness of the city on the value of land and rent.*

Distance to Louisville.	Number of farms.	Rent of land per acre.[a]	Value of land per acre.[a]
Less than 8 miles	25	$11.85	$312
9 to 11 miles	18	5.59	110
12 to 14 miles	24	5.37	106
Over 14 miles	33	4.66	95
All farms	100	6.80	158

[a] Farmers' estimates.

MANURE AVAILABLE IN THE CITY.

To some extent large quantities of stable manure are used by truck farmers in the vicinity of Louisville. This is usually bought in the city for from 50 cents to $1 per load, averaging about a ton in weight. Two farmers doing a large trucking business about 4 miles from the market place in the city each kept a man and team busy most

of the year hauling manure. Very little is hauled more than 8 miles out. Of course some is shipped out beyond this distance on railroads and trolley lines. No doubt the availability of manure at a reasonable price is one of the limiting factors in profitable truck farming in the vicinity of the city.

Truck farmers customarily put the manure in large piles to rot. It is then hauled in small two-wheeled carts and scattered wherever it is wanted.

Table X illustrates the effect of land value and nearness to the city on the use of manure and commercial fertilizer. Besides these fertilizers, a considerable amount of green stuff, such as rye, clover, and kale, is turned under. These products are not included in the total cost of fertilizer. This table shows that the use of commercial fertilizer here is not as important a factor as in many other trucking sections. The land here, as a rule, is naturally fertile, and, as is evident, manure available in the city largely takes the place of commercial fertilizer.

TABLE X.—*The effect of land value and nearness to city on the use of manure and commercial fertilizer.*

Value of land per acre.	Number of records.	Distance to Louisville.	Size of farm.	Rent per crop acre.	Value of farm manure [a] and commercial fertilizer per crop acre.		
					Barn manure.	Commercia lfertilizer.	Total.
		Miles.	*Acres.*				
Less than $80	23	16	284	$5.50	$3.75	$0.60	$4.35
$80 to $150	34	13	250	6.60	4.50	.70	5.20
$151 to $200	22	12	188	8.75	4.60	1.90	6.50
Over $200	21	8	95	15.00	18.00	1.25	19.25
All farms	100	12	212	8.60	7.35	.90	8.25

[a] The average value of manure is here estimated to be about $2 per ton load laid down on the farm.

A COMPARATIVE STUDY OF TYPES OF FARMS.

In the foregoing study of the influence of the city on farming, it is shown how there is a tendency for these farms to be smaller and more intensive near the city, while the farms 15 to 20 miles out are larger and raise general crops—corn, wheat, rye, bluegrass—and keep various kinds of live stock, such as beef cattle, dairy cows, sheep, and hogs. These enterprises are the sources of farm receipts, usually pretty well balanced between crops and live stock. Such farms may be classified as the "general mixed type." If dairying becomes a dominant enterprise, with 40 per cent or more of receipts from milk or milk products, the farm may be classified as a dairy farm. If 40 per cent or more of the receipts come from potatoes alone, the farm may be called a potato farm; if from potatoes and truck, a potato-truck farm.

These classifications are shown in Table XI. While farms of the different types differ greatly in the amount of land utilized, there is not so great a difference in the size of the business conducted. The capital invested and the expenses of operation furnish a good basis for comparing the size of business of each type.

TABLE XI.—*Relation of type of farm to size of business and labor income.*

Type of farm.	Number of records.	Acres of improved land.	Value of capital invested.	Total operating expenses per farm.	Labor income.
General mixed	39	270	$34,700	$3,667	$126
Dairy	22	205	27,782	3,686	441
Potato	11	192	35,000	3,715	333
Potato-truck	24	62	20,000	3,950	1,350
All farms	96	195	30,084	3,738	520

The potato-truck type of farming is by far the most profitable of the 4 groups. This fact undoubtedly accounts in large part for the tendency toward more intensive farming, as shown by a comparison of census statistics in 1900 and 1910. (See p. 4.)

It must not be concluded that the potato-truck farms grow only potatoes and truck, or that potato farms grow only potatoes. Other enterprises, such as corn, wheat, dairy cows, hogs, and sheep, have a place of more or less importance on most farms of these types. So also many dairy farms and general mixed farms handle enterprises characteristic of the more intensive types.

In the organization of the more profitable type of farms account must be taken of location with reference to the city, to soil, and transportation facilities. As the population of the city increases there will be a larger demand for farm products, including truck crops. The climate here allows the production of an early and a late crop of Irish potatoes each year. This condition, combined with excellent facilities for storing and marketing potatoes, makes possible the continued development of the potato-truck type of farming.

DISTRIBUTION OF CAPITAL ON FARMS OF DIFFERENT TYPES.

Table XII shows the amount and distribution of capital on the types of farms included in this study.[1] Potato-truck farms have the smallest investment both in real estate and in working capital. The investment in machinery and buildings is also lower than that of other types. The dairy farms have the least invested in cash to run the farm. In dairy farming money comes in at short intervals, so that comparatively little need be kept on hand to meet expenses.

[1] Most of the farms that may be classified as strictly "truck farms" are south of the city along the Ohio River on the sandy loam soils. Because there is not much demand in this section for suburban residence property, and because there still remains a good deal of undeveloped and unoccupied land, prices here are relatively low. These facts partly account for the low capitalization of these truck farms.

On the other hand, in the potato type and general mixed type a much larger amount must be kept on hand to meet current expenses.

TABLE XII.—*Relation of type of farm to distribution of capital on 96 farms in Jefferson County, Ky.*

[Values are averages.]

Type of farm.	Number of records.	Total capital.	Market value of real estate.[a]	Working capital.[b]	Investment in live stock.[c]	Investment in machinery.	Cash to run farm.	Investment in work stock.	Value of dwelling.	Value of other buildings.
General mixed	39	$34,700	$30,589	$4,111	$1,977	$722	$785	$1,050	$2,619	$1,626
Dairy	22	27,782	23,247	4,535	2,911	697	448	661	2,950	2,349
Potato	11	35,000	31,406	3,594	1,358	769	1,100	923	3,545	2,002
Potato-truck	24	20,000	17,511	2,489	847	620	698	697	2,062	946
All farms	96	30,084	26,198	3,859	1,986	691	706	844	2,660	1,707

[a] Value of real estate includes value of dwellings and other buildings.
[b] Working capital includes feed and supplies, but these are not separately given in this table.
[c] Investment in live stock includes the value of work stock.

THE UTILIZATION OF LAND AREA.

The potato-truck and truck farms have about 80 to 90 per cent of their improved land area in crops and about 10 to 20 per cent in pasture. These two types of farms show a better utilization of improved land area than other types, from the fact that 10 to 30 per cent of their improved area is double cropped. A very small amount of double cropping is practiced on the more extensive types of farms. Table XIII shows the utilization of land area by types of farms.

TABLE XIII.—*Relation of type of farm to the utilization of land area.*

Type of farm.	Number of records.	Acres of improved land in farm.	Per cent improved land—		
			In crop area.	In pasture.	Double-cropped.
General mixed	39	270	70	29.7	1
Dairy	22	205	48	51.6	4
Potato	11	192	77	23.0	6
Potato-truck	24	62	86	14.0	20
All farms	96	195	69	31.0	8

The pasture area on small and intensively cropped farms is usually the rougher portions of the farm along creeks and sometimes the stony and ill-drained parts. On the larger and more extensive types there is, besides the permanent pasture, pasture in rotation with other crops.

DISTRIBUTION OF CROP AREA.

Table XIV would indicate that about 50 per cent of the crop area on the average truck and potato-truck farms is used in growing truck and potatoes, crops which represent intensive farming. The remainder of the area is used for growing corn, hay, and miscellaneous crops, principally for feeding the work stock, dairy cows, and hogs. In the other type groups also a small percentage of the farm area is

devoted to truck and potato crops, showing the importance of these as money crops and the tendency toward more intensive farming. The largest percentage of green manure crops are found on farms specializing in potatoes. The practice is usually to sow rye in the fall and turn it under during the latter part of May or early in June for a late crop of potatoes, which is usually planted during the first two weeks in July. Turning under the rye and keeping the ground in good tilth and well packed with a plank drag or roller serves to retain moisture, to store humus, and to make general soil conditions favorable for the potato crop.

TABLE XIV.—*The distribution of crop area on different types of farms.*

Type of farm.	Number of records.	Crop area in farm.	Per cent of crop area in—							
			Corn.	Silage.	Potatoes.	Wheat.	Meadow hay.	Truck.	Miscellaneous crops.	Green manure crops.
Potatoes	11	133	17.9	3.4	24.9	16.2	12.9	3.5	8.8	12.4
Potato-truck	12	60	15.2	.....	29.6	1.2	12.2	24.1	8.2	9.5
Truck	12	45	16.6	.....	13.1	1.3	12.7	39.9	13.5	2.9
Dairy	22	82	26.0	9.1	5.7	7.3	15.7	2.4	28.8	5.0
General mixed	39	160	27.2	.9	8.6	17.9	21.4	2.4	14.9	6.7

DISTRIBUTION OF ANIMALS.

Table XV shows the distribution of different classes of animals on the different types of farms. On the intensive types, dairy cows, poultry, and swine are comparatively more important, while on the more extensive types, stock cattle, horses, and sheep are relatively more important. On the more intensive types of farms growing potatoes and truck, there is relatively a large amount of unmarketable products which, without stock to utilize them, would be wasted. Dairy cows, swine, and poultry utilize these as well as the permanent pasture, and thus are profitable when in proper proportion to other enterprises.

TABLE XV.—*Distribution of animals on farms of different types in Jefferson County, Ky.*

Type of farm.	Number of records.	Number of animal[a] units.	Distribution of live stock.						
			Dairy cows.	Young stock.	Steers.	Work stock raised for sale.	Sheep.	Swine.	Poultry.
			P. cent	*P. cent.*	*P. cent.*	*P. cent.*	*P. cent.*	*P. cent.*	*P. cent.*
Potato	11	12.0	30.8	13.0	12.0	1.4	2.0	23.4	17.4
Potato-truck	12	5.9	37.7	8.0	.....	.4	.....	37.7	16.3
Truck	12	5.1	29.9	14.5	.....	.....	.....	24.6	31.0
Dairy	22	40.3	62.1	13.5	2.0	3.5	4.7	9.9	4.4
General mixed	39	23.1	22.0	10.3	13.1	3.1	8.9	32.8	9.5

[a] An animal unit is the equivalent of a cow, horse, or mule. Four calves, 2 yearlings, 5 hogs, 7 sheep, or 100 head of poultry are assumed to be approximately equivalent to an animal unit. The assumption is that each of these equivalents consumes about the same amount of feed and produces about the same amount of manure measured in terms of fertilizer value.

DESCRIPTIONS OF SEVERAL FARMS ILLUSTRATING TYPES FOUND IN THIS SECTION.

In the following pages are given descriptions and summaries of the 1914 (farm year 1914–15) business of several farms, which illustrate the various types found in this section. The comments made on the organization and success of each of these farms will be better understood if the average yield of various crops and the amount of labor required to produce them are given. (See Table XVI.) These figures will also be of great practical value in estimating the total amount of man and horse labor required in growing any of these crops, as well as the total yield which may be expected under average conditions.

The farms which have been selected are among the more successful ones, and for this reason may furnish suggestions for good farm organization in this locality.

TABLE XVI.—*Estimated 5-year average crop yields per acre, and the amount of man labor and horse labor per acre required for important crops on certain farms in Jefferson County, Ky.*

Farm product.	Number of records.	Unit of yield.	Estimated 5-year average yield.	Labor required per acre or animal unit.	
				Ten-hour man-days.	Ten-hour horse-days.
				Per acre.	*Per acre.*
Corn	25	Bushels	34	3.4	3.7
Potatoes	32	Barrels	55	7.4	8.2
Wheat	25	Bushels	21	1.4	2.2
Rye:					
Thrashed	25	do	17	1.5	2.5
Cut and fed	25	Tons	0.9	1.1	1.8
Pastured	25			.2	.6
Oats:					
Thrashed	25	Bushels	31.4	1.3	1.7
Fed in bundle	25	Tons	1.1	1.3	2.0
Meadow hay	25	do	1.0	1.1	.7
Orchard grass seed	4			1.0	.7
Cowpeas and sorghum	4	Tons	1.5	1.7	2.7
Millet	4	do	1.6	1.7	2.7
Sorghum	4	do	4.6	2.0	3.0
Alfalfa	1	do	2.4	3.4	2.5
Sweet potatoes	7	Barrels	78	18.5	10.0
Large onions	10	do	57	28.1	12.4
Cabbage	7	Crates	161	18.2	9.2
Tomatoes	7	Bushels	175	26.4	14.7
Kale	3			3.7	3.4
Beets	3	Bunches	4,133	100.0	9.0
Snap beans	2	Bushels	74	11.0	7.0
Cantaloupes	3	Crates	143	10.0	8.0
Blackberries	3	do	88.7	78.0	14.0
Strawberries	6	do	101	30.0	10.0
Roasting ears	6	Barrels	32	6.5	6.8
				Per A.U.	*Per A.U.*
Cows on retail milk farms	10			21.3	7.3
Cows and young stock, general farming	16			12.6	1.7
Steers	12			3.0	2.5
Hogs	14			6.3	1.0
Sheep	14			3.6	.1

FARM 1.—A 60-ACRE TRUCK FARM.

Farm 1 is located about 12 miles from Louisville on a clay loam soil below the average in quality, the value being only $100 per acre.

The following is a statement of the business for the year 1914.

Total capital	$8,500
Working capital	2,534
Total receipts	3,550
Total expenses	653
Receipts from potatoes	735
Receipts from truck	1,988
Labor income	2,300

The crops sold were as follows:

Early potatoes, 4 acres	$180
Late potatoes, 5 acres	555
Strawberries, 2 acres	330
Onion seed, ½ acre	90
Large onions, 1 acre	480
Cantaloupes, 1½ acres	338
Melons, 1 acre	100
Tomatoes, 1 acre	250
Grapes, 2 acres	200
Garden sales, 1 acre	200

This farm bought no manure from the city, being too far away, but $87 was paid out for commercial fertilizer. There were 5 cows, bringing in $461, 2 head of young stock, 12 hogs, 200 chickens, and 3 horses. Twenty-two per cent of the receipts were from live stock.

This farm raised 11 acres of corn and 10 acres of hay, both crops yielding well, so that only a small amount of feed was bought—$81 worth. Crop yields were about 15 per cent above the average for the farms studied, and 78 per cent of the total receipts were realized from crops sold.

FARM 2.—130-ACRE POTATO-TRUCK FARM.

Farm 2 represents not only a large, but an exceptionally profitable business. It is located near the city limits, has a sandy loam soil, and is level in topography. The operator owned 40 acres and rented 90 acres for $500 cash. The land is valued at $400 per acre.

The business for the year 1914 showed—

Total capital	[1] $21,000
Working capital	5,000
Total receipts	18,500
Total expenses	7,600
Receipts from potatoes	8,370
Receipts from truck	9,728
Labor income	9,900

[1] The value of rented land is not included in this figure.

During the year over 2,000 tons of manure, easily accessible, was bought. One hundred and twenty acres were utilized for crops, 6 acres for pasture, and the remainder was idle and waste land. Sixty-six acres were double-cropped, showing intensive use of the land.

Following is a list of crops yielding income:

Roasting ears, 16 acres	$620
Tomatoes, 3 acres	180
Asparagus, 4 acres	700
Spinach, 1 acre	100
Early potatoes, 35 acres	6,125
Late potatoes, 40 acres	2,250
Beets, 3 acres	300
Cauliflower, 2 acres	450
Early crop cabbage, 6 acres	150
Late crop cabbage, 4 acres	120
Cantaloupes, 5 acres	500
Early crop lettuce, 2 acres	400
Late crop lettuce, 2 acres	400
Large onions, 4 acres	640
Onion sets, 8 acres	2,118
Sweet potatoes, 12 acres	900
Lettuce in hotbeds, 1 acre	800
Horseradish, 4 acres	800
Rubarb, 3 acres	450
Sales from greenhouse	500

Ninety-seven per cent of the receipts were from these crops.

The animals kept on the farm were 11 work animals, 2 cows, 16 hogs, and 15 chickens.

It has been remarked that 90 acres were rented for $500, an extremely low rent for land so near the city and of such quality. This land was held for residence property and tenure was uncertain. Opportunities to rent such land at this price are very rare. Usually it rents for from $20 to $25 per acre.

The largest item of expense was for labor, the total cost being $4,150.

The unusually large profits secured from this farm were due partly to the unusually high price obtained for first-crop potatoes, which on account of drought during the growing season were practically a failure, except on the sandy loam soils well supplied with manure. There was a shortage in the local market, so that farmers who had potatoes coming on early obtained from $4 to $6 per barrel for them, the more usual price being $1 to $2 per barrel. Another important factor in securing these profits was good judgment in the selection and marketing of crops. This ability is gained only by long experience in such a business. Crop yields on this farm were only about 3 per cent above the average.

It may be pointed out further that this farmer was able to handle an unusually large business, one of the most important factors in the size of profits.

FARM 3.—A 30-ACRE POTATO-TRUCK FARM.

Farm 3 illustrates the possibilities of farming on high-priced land where a good market is available. This land was valued at $800 per acre. Twenty-seven acres were utilized for crops, all but 2 acres in truck and potatoes. These 2 acres were in meadow. Two acres of rye were sown and turned under for second-crop potatoes. The rye was also pastured to some extent in the winter. Three acres were counted as waste land.

The money crops were:

Asparagus, one-half acre	$100
Cabbage, 3 acres	302
First crop lettuce, one-eighth acre	300
Second crop lettuce, one-half acre	690
Large onions, 1 acre	258
Onion sets, 1½ acres	50
Peppers, 2 acres	252
Early crop potatoes, 2½ acres	706
Second crop potatoes, 7 acres	1,530
Sweet potatoes, 6 acres	1,270
Spinach, 1 acre	490
Miscellaneous vegetables	52

Practically all of the receipts were from truck crops and potatoes, which in the case of this farm were sold principally on the local market, and so may be regarded as one of the truck crops. It is noticeable that there was a fair crop of early potatoes, which were marketed at $3.50 per barrel, while the late crop brought only $1.60 per barrel. Crop yields were 38 per cent above the average.

There were 8 work animals, a few hogs and chickens, and no cows. Feed was a large item of expense ($700), only a little being raised on the farm. Two acres of meadow produced only 1 ton of hay. Two hundred and ninety-five dollars were spent for manure and $90 for commercial fertilizer. In all $1,360 was spent for labor, of which $720 was regarded as family labor. There were 8 in the family.

The following is a statement of the business for the year 1914:

Total capital	$28,750
Working capital	4,750
Total receipts	6,000
Total expenses	3,146
Receipts from potatoes, early crop	706
Receipts from potatoes, late crop	1,530
Receipts from truck	3,764
Labor income	1,179

FARM 4.—A 58-ACRE POTATO-TRUCK FARM.

Farm 4 is one of the smaller-sized potato-truck farms, located about 8 miles from Louisville and about 2 miles from a market where is located a farmers' exchange. The land was valued at $155 per acre. It shows a fairly successful business.

Total capital	$11,840
Working capital	2,840
Total receipts	3,000
Total expenses	1,590
Receipts from potatoes	2,195
Receipts from truck	660
Labor income	830

The income from crops was distributed as follows:

Early-crop potatoes, 6 acres	$600
Late-crop potatoes, 6 acres	1,595
Sweet potatoes, 2 acres	240
Cabbage, 2 acres	220
Strawberries, 1 acre	200

Practically the entire income was from these crops, the yields of which were 12 per cent above the average.

The animals on this farm were 1 cow, with calf, 5 work animals, 5 hogs, and 100 chickens.

Besides the truck crops listed there were 12 acres of corn yielding 400 bushels, and 1½ acres of timothy. Two acres were in pasture. Only $35 was spent for feed. Fifty dollars was spent for manure and $125 for commercial fertilizer. The hauling distance, 8 miles, made stable manure more expensive than on farms nearer the city.

FARM 5.—A 340-ACRE POTATO FARM.

Farm 5, located about 10 miles from Louisville, is comparatively large in size. The quality of the land is below the average. Much of it is rolling and nearly 50 per cent of the area is in permanent pasture. It is valued at $80 per acre. A year's business showed:

Total capital	$33,000
Working capital	5,800
Total receipts	6,900
Total expenses	3,880
Receipts from potatoes	4,800
Receipts from truck and fruit	1,133
Labor income	1,365

The crops were:

Late potatoes, 50 acres	$4,800
Onion seed, 3 acres	370
Strawberries, 4 acres	225
Field crops, 4½ acres	150
Blackberries, 3 acres	150
Peaches and apples, 6 acres	150
Cherries, 1 acre	88

About 83 per cent of the receipts were from crops, the remainder from live stock.

There were 4 cows, 6 young stock, 4 horses 10 mules, 20 head of beef cattle, and 250 chickens on this farm.

Crop yields were about 3 per cent above the average.

On farms growing a large acreage of potatoes more work stock is kept than can be employed profitably throughout the year. This farm sold 4 mules after the potato crop was planted. When located near the city, the farmer may profitably employ work stock in hauling manure, and sometimes in public work, such as building roads, etc. On the whole, the stock enterprise is badly managed, since only a total of about $900 was received from this source, and yet these animals consumed produce from more than one-half the farm area and in addition $300 was spent for feed.

The labor bill on this farm was $1,900. One hundred dollars went for manure and $700 for commercial fertilizer.

FARM 6.—A 590-ACRE GENERAL MIXED FARM.

Farm 6 is a large farm valued at $42 per acre and located about 20 miles from Louisville. It is organized as a general mixed farm on which practically one-half of the receipts are from live stock.

The business for 1914 showed:

Total capital	$29,476
Working capital	4,400
Animal units	50
Total receipts	5,400
Total expenses	1,900
Receipts from live stock	1,670
Labor income	2,000

The income from crops sold was as follows:

Corn, 125 acres	863
Wheat, 50 acres	950
Stover	20
Straw	200
Alfalfa, 25 acres	240
Timothy, 60 acres	270
Tobacco	120

The live stock on this farm were 4 cows, 3 head of young stock, 137 sheep, 30 hogs, 9 horses and mules, and 5 colts. All these enterprises yielded some income, sheep yielding the highest.

About 160 acres were devoted to permanent pasture and 150 acres were in woods, from which there was no income.

Fifty acres of corn and 2 acres of tobacco were raised by a cropper, who got one-half of the crop. Crop yields were only 68 per cent of the average, and receipts per animal unit 89 per cent of the average.

One wage hand was hired for the year, and $700 was spent for extra labor. No commercial fertilizer or manure was bought. Two hundred and sixty-three acres devoted to field crops were generally level, the remainder being hilly and much of it in woods. On the whole this was a well-organized business for the kind of land and location.

FARM 7.—A 50-ACRE DAIRY FARM.

Farm 7 illustrates a well-organized dairy business on a small-sized farm. The location is 6 miles from Louisville. The land is of good quality and is valued at $350 per acre. Crop yields were 55 per cent above the average. Ten acres were in pasture. The business showed:

Total capital	[1] $15,300
Working capital	5,300
Number of cows	48
Total receipts	8,700
Total expenses	4,200
Receipts from dairy	7,700
Receipts from truck and potatoes	375
Labor income	3,700

The crops were—

Corn, 10 acres	400 bushels.
Potatoes, 5 acres	150 barrels.
Oats, 12 acres	36 tons.
Timothy, 6 acres	10 tons.
Sorghum and cane (soiling crops)	5 acres.
Onions	½ acre.

Feed bought cost $2,000, of which $1,800 was for bran and cotton-seed meal.

This farmer owned 25 acres and rented 25 acres additional for $450 cash. The labor cost was about $1,300. Two regular hands were employed and $300 represented family labor.

An excellent quality of business is shown by the fact that receipts per cow were $160. About 26,000 gallons of milk were sold at an average price of nearly 28 cents per gallon.

[1] This includes the value of the owner's land only.

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